NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
1520 H STREET, NORTHWEST · WASHINGTON 25, D. C.
TELEPHONES: DUDLEY 2-6325 · EXECUTIVE 3-3260

FOR RELEASE: UPON DELIVERY
8:30 p.m. EDT

RELEASE NO. 61-229

Address by
James E. Webb, Administrator
National Aeronautics and Space Administration

THE TWENTIETH AMERICAN ASSEMBLY
Arden House, Harriman, New York
October 19, 1961

* * *

"Initiative and Responsibility
in the Study and Use of Space"

Dr. Wriston and Members of the American Assembly:

On previous occasions in this hall, it has been my privilege to sit before a speaker who was prepared to set the stage for a vigorous rubbing of minds on an important national subject and to help establish guidelines for discussion.

Tonight the situation is reversed. As I look about and see so many men who have made such important contributions to the surging advance of science and technology as it relates to space, I have a feeling that rather than stand here at the beginning of this Assembly, I should sit with you at the end to assimilate the results of your discussions. Nevertheless, I will do my best.

It may not be amiss to begin with the fact that our national program for the exploration and utilization of that vast medium to which we apply the term "space" involves action as well as philosophy and policy. Indeed, in many cases, we cannot choose our actions free of pressures beyond our control.

Many important actions have been taken since the passage of the National Aeronautics and Space Act in 1958. Others are now in preparation, and it will be my purpose tonight to show that these actions form for our nation a pattern of initiative and responsibility, as well as responsiveness to a deeply felt need of the American people.

As background for my discussion, and your own in the days ahead, you have received a splendid perspective from your editor, Lincoln Bloomfield, in his paper, "The Space Revolution."

He points out that while this revolution "is essentially still in the hands of a small elite" who "may and do propose, the people, in the last analysis, will dispose."

Making clear his view that "in the end the problem of outer space is a problem of human values" and that beyond the national arena "the conquest of space is an opportunity for statesmen to build their structures in a still relatively uncluttered area of interaction between the nations" he cites "the lag between scientific technology and the human capacity to maximize its benefits and minimize its harm through social, economic, and political arrangement."

In my view, Mr. Bloomfield practices the realism for which he calls when he states that "the question of ultimate public support remains before us, along with virtually all the grand issues of public policy." The "grand issues" may take longer, but in some large measure, the question of public support will be answered as Congress acts on the 1963 Space Budget. The requirements will be substantially larger than in 1962. The openness with which we conduct our operations often seems to emphasize the spectacular nature of such a success as the first manned flight in our Mercury program by Alan Shepard. Whether it turns out to be a success or failure, the launching of the Saturn first stage for its trial flight -- planned to take place within

the near future -- will attract the widest attention and be viewed by millions. Such flights are not stunts. They are not antithetical to sober scientific and technological research. Interpreted properly, these dramatic events can add much to public understanding and excite creative interest in extending the base of knowledge on which public support must rest.

But public support depends upon more than interest and understanding. The method of presentation, as well as the substance of the program, is important. The fact that President Kennedy's request for increases in the 1962 Space Budget were presented on a bipartisan basis and were so accepted by the Congress shows this.

From the beginning of my meetings with him on space questions, President Kennedy has viewed our problems as not solely scientific or technical but as questions of broad national and international policy and of the organization of private and governmental resources to make policy effective. He has regarded an adequate national space effort as vitally important to the United States, and as a long-range program which cannot be turned on and off at will. He has often expressed a strong feeling that the ability of the United States to achieve its great international goals of peace and fulfillment for all mankind depends to a large degree upon what we can achieve in space.

No discussion of our national space effort and of the kind of public support that it must justify and retain over an extended period would be complete without some indication that to the person with little or no space background, the man or woman going about daily tasks, reading and hearing about manned orbital flight, manned exploration of the moon, or the great radiation belts, space is almost beyond comprehension. It is an entirely new and different sphere. It is separated by a wide gap from normal experiences, the things we know from our eyes, ears, hands, and other senses. One of the greatest tasks of space leadership is to find ways to bridge this gap.

Before this group, it is not necessary to compare the fifty-eight years of man's powered flight in the atmosphere with the four years since man proved his ability to achieve space flight. Nor is it necessary to linger over the fact

that in the United States, where they took place, experimental demonstrations by the Wright Brothers in 1903 that powered flight was feasible and in 1926 by Dr. Robert Goddard that rocketry was practicable, were received with indifference or scorn. Here, these harbingers of the future were so neglected that the first utilization of the lessons learned were exploited abroad.

In aviation, we learned this at our grave risk during World War I but built our position in the inter-war years.

In rocketry it took a dozen years after the V-2 experience of World War II, plus the demonstrated rocket competence of the USSR, to crystallize our policy, programs, and organization into a national space effort.

The lead time of 45 years, from the Wright Brothers to jet performance in aircraft, is one measure of the technical achievements required in such matters. To accomplish all that must be done to achieve a manned lunar expedition within a span of ten years will require every possible acceleration in technological advances and their application. Research and development in direct and in supporting areas must be pursued to the utmost of our abilities, without let-up.

Although long lead times are hard to explain in bidding for and retaining public support, there is nevertheless no avoiding them in space work.

I believe it is clear from the papers prepared for this Assembly, that in the period since the National Aeronautics and Space Act was passed in 1958, and as a result of strong pressures to step up our national effort, a substantial space program has been set in motion. The year 1958 marked the culmination of vigorous debate on space policy, just as such a culmination had come in 1946 in the atomic energy field. In the one case, the result was the establishment of the National Aeronautics and Space Administration and, in the other, the Atomic Energy Commission.

In each case, important military developments and uses were reserved to the Department of Defense. In both cases, however, national policy was founded and oriented toward development and utilization of science and technology to

the greatest possible extent for peaceful purposes. Significantly, in both fields the policy of the United States has emphasized benefits to be obtained not only within our own country but also in implementation of our international policy to assist other nations in economic, political, and social growth toward democracy and self-determination.

The United States has made major efforts to limit the destructive potential of nuclear fission and to find ways and means to expand its constructive use to solve the problems of mankind.

The same policy has been followed with respect to our space effort.

In the 1958 Space Act, among the basic policies written into law were:

"...that activities in space should be devoted to peaceful purposes for the benefit of all mankind."

"...that the general welfare and security of the United States require that adequate provision be made for aeronautical and space activities. ...that such activities be the responsibility of... a civilian agency..., except... activities peculiar to or primarily associated with the development of weapons systems, military operations, or... defense... and that determination as to... responsibility for... such activity shall be made by the President..."

"That aeronautical and space activities be conducted so as to contribute to:

(1) The expansion of human knowledge of phenomena in the atmosphere and space;

(2) The improvement of the usefulness, performance, speed, safety, and efficiency of aeronautical and space vehicles;

(3) The development and operation of vehicles capable of carrying instruments, equipment, supplies, and living organisms through space;

(4) The establishment of long-range studies of the potential benefits to be gained from, the opportunities for, and the problems involved in the utilization of aeronautical and space activities for peaceful and scientific purposes;

(5) The preservation of the role of the United States as a leader in aeronautical and space science and technology and in the application thereof to the conduct of peaceful activities within and outside the atmosphere;

(6) The making available to agencies directly concerned with national defense of discoveries that have military value or significance, and the furnishing by such agencies, to the civilian agency established to direct and control nonmilitary aeronautical and space activities, of information as to discoveries which have value or significance to that agency.

(7) Cooperation by the United States with other nations and groups of nations in work done pursuant to this Act and in the peaceful application of the results thereof; and

(8) The most effective utilization of the scientific and engineering resources of the United States, with close cooperation among all interested agencies in order to avoid unnecessary duplication of effort, facilities, and equipment.

To make these policies effective the 1958 Act provided that the National Aeronautics and Space Administration would:

(1) Plan, direct, and conduct aeronautical and space activities;

(2) Arrange for participation by the scientific community in planning scientific measurements and observations to be made through use of aeronautical and space vehicles, and conduct or arrange for the conduct of such measurements and observations; and

(3) Provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof.

Expenditures for the first full year by the National Aeronautics and Space Administration (Fiscal Year 1960) were four hundred and one million. For the second full year (Fiscal Year 1961), they were seven hundred and sixty million. And for the current Fiscal Year (1962), President Eisenhower, in his final budget message on January 16, 1961, recommended an increase to the level of a billion, one hundred and nine million dollars of new authorizations with an estimated expenditure of nine hundred and sixty-five million dollars.

From all this, it is clear that, between the establishment of the National Aeronautics and Space Administration in 1958 and the end of the Eisenhower Administration, a substantial build-up was already in progress.

During this period in the field of aeronautics, NASA programs were based on a continuation of research, advanced technology development, and flight testing, but with none of the aspects of an operating agency.

In astronautics, however, during these three years implementation of a ten-year plan was begun, under which NASA would carry out not only research and design but all other aspects of an operating agency, such as procurement, launching operations, and data collection and evaluation.

The four major fields to be covered in the ten-year plan were: scientific satellites, lunar and planetary exploration, application satellites (in such areas as weather and communications), and manned space flight. Analysis and publication of the data in each of these fields was programmed.

Under the ten-year plan, the two outstanding space missions projected for 1961 were to be the suborbital flight of an astronaut and a manned orbital flight.

The 1962 mission milestones were considered to be an impact landing of instruments on the moon, advances in planetary spacecraft, and launching of a prototype active communication satellite.

In 1963 there were to be a soft landing of instruments on the moon and the first launching of a three-stage Saturn C-1, having over a million and one-half pounds of thrust.

Nineteen Sixty-Four was to be signalized chiefly by an orbiting astronomical observatory and an unmanned planetary reconnaissance.

For 1965, the major milestone was to be a prototype-capsule test for Apollo, which was conceived as a three-man, earth orbiting laboratory and also as a basic vehicle for manned exploration of the moon.

For 1966, extending through 1970, the original plan called for first flights by the three-stage Saturn C-2, having more than twice the payload of the C-1 in a near-earth orbit as a result of the added stage -- the nuclear rocket Rover -- for a spacecraft in a planetary orbit, and for a manned Apollo earth-orbital flight and a manned Apollo circumlunar flight.

The manned lunar landing mission was considered to lie beyond 1970.

A reasonable estimate of expenditures to accomplish this ten-year plan, as it was laid out at the beginning of 1961, would lie between twenty and twenty-five billion dollars.

One of the important decisions voiced by President Eisenhower in his submission of the Fiscal Year 1962 budget was elimination of funds to press forward under the ten-year program with the large rocket boosters and with long lead-time work on Apollo. This meant that the manned lunar landing, (programmed to come after 1970) could not, in fact, take place under the most favorable circumstances before about the middle of the 1970's.

Mr. Eisenhower's words in his budget message were: "Further testing and experimentation will be necessary to establish whether there are any valid scientific reasons for extending manned space flight beyond the Mercury program."

Within two months and four days after the inauguration of President Kennedy, the United States launched five satellites -- one Explorer, two Discoverers, Samos II, and Transit 3 B. Within the same period the Russians launched three

Sputniks -- VII, VIII, and IX -- and a Venus probe.

Concurrent with these operations, an intensive study was going on under the direction of Vice President Johnson, with the active participation of such senior officials as Defense Secretary Robert McNamara, Atomic Energy Chairman Glenn Seaborg, NASA Deputy Administrator Hugh Dryden, and myself.

On March 24, President Kennedy announced that the key to retrieving our position in space lay in determining that we could no longer proceed with the Mercury one-man space ship as if that were to be the end of our program but that we must, even in a tight budget situation, commit ourselves to build giant boosters. He submitted a request for an additional $125,670,000 to speed up the Saturn C-2 booster and the large million-and-a-half-pound-thrust F-1 engine.

One day later, March 25, the United States launched its sixth satellite of the year, Explorer X, and the Russians launched their fourth Sputnik of the year, Sputnik X. Two weeks later, April 12, the Russians accomplished a manned orbit of the earth with Cosmonaut Gagarin, in the space ship Vostok.

In the two months following the March 24th decision of the new Administration to step up the big booster program in order to provide lift for larger and more advanced spacecraft, an intensive analysis of every facet of the program was conducted and the reorganized National Aeronautics and Space Council, under the leadership of its Chairman, Vice President Johnson, came increasingly into play. As a result, on May 25, the President announced major new goals for the nation in space and new programs to achieve them.

The President requested that appropriations for the National Aeronautics and Space Administration be increased to $1,784,000,000, or by about 61 percent, but Congress reduced this by about $112 million. It is an interesting fact that while NASA spends about 80 percent of its funds through contracts, requiring outstanding technical and management ability to handle these contractural relationships, the most serious cuts were in these areas where the funds were needed most. In this second request the President asked increases for big engines and big boosters aggregating $144 million. He included in his request an

additional $130 million for Apollo. Sixty-six million dollars were earmarked to speed exploration of the environments of the earth and of the moon, and the space between. President Kennedy requested funds for studies of the problems of spacecraft returning to earth from flights around the moon at atmospheric entry speeds as high as 25,000 miles an hour and for thorough studies of radiation problems, including an analysis of solar activity over the past fifty years in order to predict, if possible, the periods of extreme radiation which manned spaceflight must avoid.

Included also was an item of $50 million to expedite development of an active communications satellite system and to demonstrate transatlantic television.

The President requested funds for the Air Force to proceed with solid-propellant engines for a Nova vehicle.

An additional $23 million was provided to expedite the Rover nuclear-rocket engine.

One way of looking at the eight months since January might be to say that the major actions taken by the new Administration to accelerate the national space effort were to initiate a program to accomplish within the ten years of the 1960's approximately the same volume of space research and development, exploration, and beneficial applications as plans of the previous Administration envisioned in about fifteen years.

It is important to note that while the major manned space flight missions and related scientific exploration of space remained in the civilian National Aeronautics and Space Administration, they were speeded up. Large boosters capable of putting heavy payloads into orbit or for use on other space tasks will be built without delay. This means that if military missions are required in the future, the booster capacity will be available.

Let me hasten to add that none of the above has changed the policy of the United States to make every effort to use space for peaceful benefits to all mankind.

Only three weeks ago, President Kennedy urged at the United Nations a policy of "keeping nuclear weapons from

seeding new battlegrounds in outer space."

Proposing that "...as we extend the law on earth, so must we also extend it to man's new domain, outer space," the President stated that "The new horizons of outer space must not be riven by the old bitter concepts of imperialism and sovereign claims. The cold reaches of the universe must not become the new arena of an even colder war."

The President went on to say, "To this end, we shall urge proposals extending the United Nations' charter to the limit of man's exploration in the universe, reserving outer space for peaceful use, prohibiting weapons of mass destruction in space and on celestial bodies, and opening the mysteries and benefits of space to every nation. We shall propose further cooperative efforts between all nations in weather prediction and eventually in weather control.

"We shall propose, finally, a global system of communications satellites linking the whole world in telegraph and telephone and radio and television."

Thus it is clear that the United States is proceeding with a program that can, should the need arise, substantially increase its military capability. At the same time, we are keeping these activities oriented toward peaceful uses and urging the leaders and scientists of other nations to join with us in this vast new area that holds so much promise.

Perhaps another way of looking at the space program is to consider it a ten-year effort to advance science and technology at the most rapid rate possible in the most important fields of energy use; new materials, metals, fabrics, and lubricants; the most advanced electronics and communications; the marriage of the life sciences with the physical sciences; the harnessing of advanced scientific and technological research and development with operational missions, data collection, storage and evaluation; the development of experimental models into practical useful devices; and in general systems management of a high order of efficiency. If this concept is considered in the light of the language of the 1958 Space Act, which calls for the preservation of the United States as a leader in aeronautical and space science and technology and in the

application thereof to the conduct of peaceful activities, the leverage of this program in a growing national economy can be of great significance.

You here at this Assembly are more keenly aware, I am sure, than are most citizens of the fact that in the decade from 1960 to 1970, if we can avoid war, the number of our fellow countrymen requiring food, clothing, and services will rise from one hundred and eighty million to two hundred and thirteen million; that public and private construction will rise from an annual rate of $55 billion to more than $90 billion; that more than $700 billion of construction will be put in place; and that, with the addition of some three hundred to four hundred billions of maintenance and repair, our investment in these capital items will add up to more than a trillion dollars during the period.

The space program is the first that broadly teams the life sciences with the physical sciences, thereby substantially increasing its capacity to feed back benefits in all areas of economic, political, and social growth. Again, the fact that the National Aeronautics and Space Administration is required by the 1958 Space Act, to "provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof" is of no little significance.

In his thoughtful paper prepared for you, the first Administrator of the National Aeronautics and Space Administration, Dr. Keith Glennan, asks if it is possible to pose specific questions, among them -- "Should our energies and funds be devoted to the accomplishment of a few spectacular shots" or "are not the shorter range objectives of developing useful applications of space technology in the fields of communications, meteorology, and navigation -- activities that promise real benefits to mankind -- equally or even more important as national objectives?" Commenting on these and other difficult questions with respect to what our goals should be, Dr. Glennan gives us the benefit of his experience when he says,"There is a hard decision to be made here."

In my own opinion, there is little doubt that, unless we press forward vigorously in all of these fields, we would see the Russians, with the advantages of their advanced position in booster thrust, stay continuously ahead, and we

ourselves would fail to move forward as rapidly as we could with useful applications to meet our own needs. The cost over the ten years of our accelerated program will very probably be less than if it were stretched out over fifteen years. The benefits will be immeasurably greater. The total ten year cost will be no more than two-thirds of the present cost of one year of our current military program.

The policy of the present Administration is to press forward in all related areas of science and technology at the most rapid rate that can be justified by the state of the art, without involving the wastefulness of crash programs.

A few moments ago, I spoke of the actions that have been taken and of those in preparation as indicating the course which the space program may be expected to take.

This may be more meaningful if we visualize that as soon as it became clear that Congress would approve the program, a series of actions were initiated to start the forward motion.

Two thousand, two hundred discrete tasks were analyzed with respect to possible schedules and probable costs. These elements were fitted into a single master schedule through massive computer runs, using the performance evaluation and review technique (PERT) to determine that manned lunar exploration was feasible within the ten-year period. On the third run, we found an acceptable course along which to initiate action, but it is important to recognize that a number of problems are unresolved and await further research and technological advance.

Work in space science has not been subordinated to the man-in-space program, but has rather been increased and given added emphasis as a necessary first step in all our programs.

Research that can be conducted here on earth on the scientific and technological problems associated with space has been increased wherever this was the most efficient way to accomplish the desired results.

Work in aeronautical research and in the study of atmospheric flight has been increased and extended to determine every area in which gains for the space program,

as well as for manned flight in the atmosphere, could be obtained.

In the field of big boosters, we are proceeding rapidly to a test of the first stage of the Saturn C-1 and have under contract both the S-2 (second) and S-4 (third) stages. Both are based on the very advanced liquid-hydrogen, liquid-oxygen technology, and both will be used in later and larger boosters. Beyond the Saturn C-1 configuration, we are in the final stages of selecting a contractor to build a first stage for an advanced Saturn which will provide a thrust from two to four times that of the C-1, or up to a level of six million pounds.

For very advanced missions requiring the heaviest payloads, the giant Nova booster, with a thrust range of 12 to 20 million pounds, may be required. We are continuing work to develop the basic information to permit a decision as to whether this booster would serve our purposes better if composed of clusters of large solid-propellant engines or the large liquid F-1 engines.

At the same time, we are thoroughly exploring the possibility of building large space ships out of components placed in orbit around the earth by medium-sized rockets such as the advanced version of Saturn. However, until this is proven feasible, we will continue to work toward the building of Nova.

In developing our facilities for launching of rockets at Cape Canaveral and for their fabrication and static test near New Orleans, we are incorporating the kind of flexibility that will enable us to take advantage of either the large rocket systems for a direct ascent to the moon, or of medium-sized systems employing the rendezvous-in-orbit technique, or of other proposed methods of accomplishing our goals.

With respect to advanced spacecraft missions, we have expanded the number of our lunar exploratory Ranger launchings from five to nine, we are undertaking to launch a Mariner spacecraft toward Venus when it is nearest the earth in 1962, and we have received proposals from interested contractors for the development and building of the Apollo spacecraft. We expect to award the contract and begin work before the end of the year.

With respect to the ongoing flight program, we have conducted not only the first animal and manned suborbital flights, but have gone far to prove the Mercury-Atlas system with a successful unmanned orbital flight and recovery.

Also among our successful launches was the third weather satellite, TIROS III, which reported the daily position of hurricanes and was responsible for the discovery of hurricane Esther two days earlier than would have been possible by other methods. Among the scientific satellites launched this year were Explorer XI, which is sending back data on gamma rays emitted from various regions of the sky, and Explorer XII, which is surveying energetic particles over a highly elliptical trajectory extending from two hundred to nearly fifty thousand miles above the surface of the earth.

We have also had our failures, but we have learned from each of them.

With respect to our worldwide tracking facilities, they have been substantially completed and tested by such flights as the unmanned orbital Mercury-Atlas flight last month. The communications network and the computer and operational capabilities of our data acquisition, storage and use facilities have met our requirements. We have demonstrated that this worldwide tracking communication and data acquisition network is a priceless national asset.

With respect to the applications through which space science and technology can begin to yield useful benefits, public policy has been established to bring into being as quickly as possible a worldwide operational system for communications based on relay satellites.

In this field, three important research and development projects have been instituted. These are Project Relay, being developed for NASA by the Radio Corporation of America; the TSX satellite program through which the American Telephone and Telegraph Company is applying its own resources at its own expense to contribute to an early national operational capability; and the Syncom utilizing the resources of the Hughes Aircraft Company.

All these projects are being carried out in the closest association with the Federal Communications Commission and

other interested government departments as well as with the organizations and interests in other nations concerned in international communications. The principle of privately regulated operation by a grouping of the present carriers has been endorsed, and a strong effort is being made to implement it. However, complete reservation of foreseeable governmental interest has been made. Governmental needs include those relating to international cooperation, worldwide availability of service, and such military needs as can be fulfilled through the use of common carriers.

Arrangements have been made to keep a TIROS weather satellite in orbit at all times until a follow-on system operated by the United States Weather Bureau and based on the Nimbus satellite is brought into being.

Congress has now appropriated funds for this, and the Weather Bureau will this year initiate the first steps toward the Nimbus worldwide meteorological network. Meanwhile, an international conference of all nations interested in participating in this new worldwide weather satellite system has been called and will be held within the next few weeks.

The United States Navy has made a large step forward in the applications field through the successful launching of the Transit navigational satellite. Arrangements are now being considered to utilize Transit capabilities to meet the navigational requirements of commercial airplanes and ships.

I hope this explanation of some of the actions we have taken will serve to make the program more meaningful. I believe that these actions also demonstrate that, in such matters, we Americans are a pragmatic people. We have always adopted new measures to meet new conditions. In the postwar period, major milestones were passed with the adoption of the Marshall Plan, the North Atlantic Treaty Organization, the Berlin airlift, support of the United Nations action in Korea, the landing of troops in Lebanon, and others that you can recall. Now that we are faced with another national requirement that will commit us for many years to a major undertaking, we are well aware that second best is not good enough.

Most Americans are beginning to understand that the rocket is the first instrument available to us that can

provide great thrust in the atmosphere and also in the reaches of space. There is a spreading understanding that it is this rocket-based ability to fly experimental equipment beyond the earth's atmosphere that now opens to scientists a vast new step toward examining the forces of nature and particularly the relationships between the earth and the sun. Ways of means of extending man's knowledge of astronomy, electromagnetic waves, nuclear reactions, plasma physics, gas dynamics, relativity, gravity, and many other areas are being more and more discussed in inter-disciplinary meetings on university campuses and are spreading out from there for broader general public understanding. At least some of the public is catching up with Editor Bloomfield's elite.

To the pragmatic American, proof that man can survive in the hostile realm of space if not enough. A solid foundation for public support and the basis for our Apollo man-in-space effort is that U.S. astronauts are going into space to do useful work in the cause of all their fellow men. If the conditions required for useful work in space are formidable, so are the tasks of stretching technology to meet them.

When I first went over to the State Department in 1949, Bob Lovett, my predecessor as Under Secretary, cheered me up considerably when he told me that trying to effect a reorganization would be like attempting to take out the appendix of a man carrying a heavy trunk up three flights of stairs.

The organization problems of the new program in the Space Administration have been no less acute. However, in the past eight months -- based largely on the splendid organizational work and careful studies made by the first NASA Administrator, Dr. Keith Glennan -- we have established a pattern that is, at one and the same time, practical and flexible. It takes account of the best abilities of our senior people, establishes strong leadership in our research and operational centers, makes authority and responsibility run together, and provides for sensitive but effective command and control of the resources required in our space program.

We have divided our work into four major program categories: 1) advanced research and technology in aeronautics

and space; 2) scientific study of the space environment and celestial bodies, through all available disciplines, and by instrumented unmanned satellites and space probes; 3) application of earth satellites to such immediate uses as weather observation, global communication and navigation; and 4) exploration of space by man.

Each of the four NASA Program Directors, within his particular program area, has over-all responsibility for projects, establishes technical guidelines, budgets and programs funds, schedules each project, and evaluates and reports progress.

The Directors of NASA's research and development centers report directly to the Associate Administrator who serves as general manager. In this way, they have an increased voice in policy making and program decisions.

Looking back at highlights of the past eight months, there was the work involved in evaluating the resources and requirements, integrating our efforts with those of the Department of Defense and other government agencies, working with Director of the Budget, the Vice President and Space Council, and the President, himself, to determine the total range of Executive Branch requirements. There were the approximately thirty appearances before Congressional bodies to justify the President's recommendations; there were the innovations required in the communications satellite field to carry on the research and development to meet governmental requirements and at the same time bring into play, in a manner consistent with the public interest, the very large resources of the principal potential user of any foreseeable system (the American Telephone and Telegraph Company).

These efforts resulted in a virtual doubling of the program and in laying a foundation under which it will again almost double in 1963. What these busy months add up to, I think, is a national space effort characterized by initiative on the part of many able men and responsibility on the part of those who had to make the governmental decisions, all in the best tradition of American democracy.

# # #